

Flight Testing Surfaces Engineered for Mitigating Insect Adhesion on a Falcon HU-25C

Insect residue contamination on aircraft wings can decrease fuel efficiency in aircraft designed for natural laminar flow. Insect residues can cause a premature transition to turbulent flow, increasing fuel burn and making the aircraft less environmentally friendly. Surfaces, designed to minimize insect residue adhesion, were evaluated through flight testing on a Falcon HU-25C aircraft flown along the coast of Virginia and North Carolina. The surfaces were affixed to the wing leading edge and the aircraft remained at altitudes lower than 1000 feet throughout the flight to assure high insect density. The number of strikes on the engineered surfaces was compared to, and found to be lower than, untreated aluminum control surfaces flown concurrently. Optical profilometry was used to determine insect residue height and areal coverage. Differences in results between flight and laboratory tests suggest the importance of testing in realistic use environments to evaluate the effectiveness of engineered surface designs.

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